

The University of Kansas Medical Center

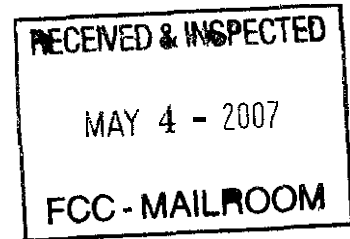
Center for TeleMedicine & TeleHealth

Federal Communications Commission
c/o Commission's Secretary

236 Massachusetts Avenue; **NE**

Suite 110

Washington, DC 20002



Dear Commissioners,

Enclosed is the application of the Kansas University Medical Center (KUMC) for the ***Rural Health Care Pilot Project, WC Docket No. 02-60***. The Kansas University Medical Center is the leading telemedicine provider in the state of Kansas and one of the earliest, most successful telemedicine programs in the United States. KUMC has partnered with a number of state health care and government agencies to propose this project for a statewide healthcare network that supports a variety of telemedicine and health information exchange (HE) applications in a private, secure environment. We feel that this multi-stakeholder initiative has the potential for long-term sustainability and is in the best interest of the state of Kansas and all Kansans. We also believe that it is an exceptionally cost-effective use of Universal Service Fund resources. The following representatives may be contacted for additional information:

For project or technical questions, please contact:

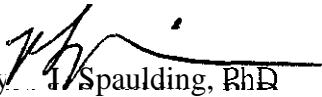
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For official administrative, grants or contracts questions, please contact:

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If you have other questions or need more information, please do not hesitate to contact us. We appreciate your full consideration.

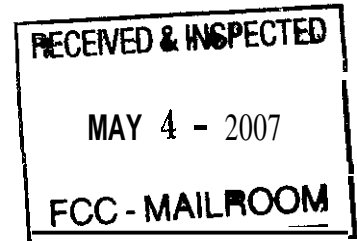
Sincerely,


Ryan J. Spaulding, PhD

Director
Center for Telemedicine & Telehealth
Kansas University Medical Center

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Before the
Federal Communications Commission
Washington, DC 20554



*Application of Kansas University Medical Center,
Center for Telemedicine & Telehealth, for funding
under the Rural Health Care Pilot Program*

I. Legally and Financially Responsible Organization

Kansas University Medical Center Research Institute
Kansas University Medical Center
3901 Rainbow Blvd.
Kansas City, Kansas 66160
EIN#: 481108830
DUNS#: 016060860

II. Goals and Objectives of the Proposed Network

INTRODUCTION

This proposed project is predicated on six significant factors that make Kansas an ideal state in which to pilot a health care network for telemedicine, health information exchange (HIE) and other health information technology (HIT) applications.

1. Kansas is one of the most rural and underserved states in the United States, with nearly 38% of its population living in rural areas compared to a national average of 20%.¹ In addition, 100 of 105 Kansas counties are designated as medically underserved areas or having medically underserved populations.² Therefore, the need for benefits of telemedicine and HIE is 'extremely acute' as noted in the pilot project announcement.
2. Kansas has **83** Critical Access Hospitals (CAHs), the most CAHs of any state in the U.S., none of which are connected to a private health care network.³ Critical Access Hospitals by definition are located in rural areas and provide access to health care for rural populations. While other health care clinics and organizations will be eligible for KanHealth service, CAHs will be the initial focus.
3. Kansas has **NO** dedicated health care network for private, high bandwidth health care applications despite an abundance of network resources in the state including Kan-ed (education), KanRen (education and research) and KinWin (state government). This

¹ United States Department of Agriculture. (2002). *Agriculture Fact Book 2001-2002*. Retrieved from www.usda.gov/factbook/index.html on March 6th, 2007.

² Health Resources and Services Administration, U.S. Department of Health and Human Services. *Medically Underserved Areas/Medically Underserved Populations*. Retrieved from www.muafind.hrsa.gov/index.aspx on March 6th, 2007.

³ Rural Assistance Center. Critical Access Hospitals. Retrieved from www.raconline.org/info_guides/hospitals/cah.php on March 6th 2007.

project proposes to leverage these existing network resources and extract a “virtual” network dedicated for health care purposes only.

4. Kansas Governor Kathleen Sebelius is pioneering a significant statewide HIE/HIT initiative that began in fall 2005 and has enlisted multiple stakeholder support and participation. This initiative has outlined currently available and future content as well as necessary standards for a Kansas-wide, high-speed network.
5. Kansas has one of the earliest and most experienced telemedicine programs in the United States, the Kansas University Center for Telemedicine & Telehealth (KUCTT) of Kansas University Medical Center (KUMC). KUCTT has over 16 years of telemedicine development and management experience.
6. Finally, the KUCTT, in collaboration with Marquette General Hospital (Michigan), Michigan State University and Purdue University, is one of only five Telehealth Resource Centers (TRCs) in the United States that were recently funded by the Health Resources and Services administration. This partnership provides unique telehealth resources and expertise for the Kansas network that are available in only four other regions of the U.S.

These combined needs and unique assets position Kansas as an excellent environment in which to test the feasibility of creating a health care network via the Universal Service Fund/Rural Health Care mechanism. The proposed network will provide a centralized solution for a comprehensive array of existing and future advanced telecommunication and information services that enable efficient, “real-time” health care. Ultimately, a variety of regional and statewide telemedicine, HIE and other health care initiatives will be united under a single governing authority and technical infrastructure. Ryan J. Spaulding, PhD, director of the Center for Telemedicine & Telehealth, has convened the KanHealth Advisory Committee comprised of Kansas health care and networking leaders from Kan-ed, the Kansas Association of the Medically Underserved (KAMU), the Kansas Department of Health and Environment (KDHE), the Kansas Health Policy Authority (KHPA), the Kansas Hospital Association (KHA) and Kansas University Medical Center to develop and oversee this pilot project. It is structured around the strategic Goals and Objectives described next.

GOALS OF PILOT PROJECT

Goal 1: Engineer a statewide, broadband, private network for a broad range of telemedicine, Health Information Exchange (HIE) and HIT purposes that is robust and interoperable with Internet2 (I2) and the growing National Health Information Network (NHIN). For the purposes of this application and this pilot, the proposed network will hereafter be referred to as *KanHealth*.

Objective 1a: Leverage existing state network resources and “carve out” a dedicated, private network called KanHealth for technology-enabled health care services and health information exchange. A March 2007 report by the Calence consulting group has identified the technical strategies necessary to “consolidate” existing Kansas networks into a single, statewide backbone for a reduction of costs and technical duplication. The Calence report was commissioned by Kan-ed and presented to the Kansas legislature on March 7th, 2007. The proposed project will extend the Calence report another step by

designing a health care network within the consolidated architecture. From this converged network, bandwidth will be virtually segmented to form KanHealth. By leveraging existing state network resources and reducing costs, the resulting backbone will be well-positioned to continue receiving long-term state funding, therefore increasing the likelihood of KanHealth sustainability (*see Sustainability section later in this proposal*).

Creating **KanHealth** as a segment of the existing Kan-ed backbone and access-layer methodologies will require a significant network design/engineering study in order to find the best acceptable model(s). While the "traditional" ISO layer 2 "circuit" connections satisfy control and privacy issues at the access layer, they create additional routing problems and complicate Internet 1 access. Though there are effective methods to address this today, they were not as prevalent 3-4 years ago when Kan-ed access planning was taking place. Identifying the latest, most effective methods will require a research project that could reveal the methods that optimize KanHealth as well as the rest of the Kan-ed network. ISO Layer 3 peers are also not completely prohibitive. Because this connectivity represents a very high quality, encrypted VPN from inside the hospital or health care provider through the local provider connection and terminating in the Kan-ed backbone, it might also represent a reasonable solution. However, these details need to be resolved. Kansas' experience with Kan-ed in recent years has demonstrated that any new solutions should be very carefully scoped and constrained. Modifications and custom "one-off" solutions in the access-layer drastically drive up the operating expenses of the network while reducing the quality of connectivity and MTTR during outages and failures. For a more detailed description of these access layers issues and the proposed network design study, please see **Appendix A**.

Objective 1b: Deploy KanHealth as the technical solution to the state's technical infrastructure needs for health care as defined by Kansas Governor Kathleen Sebelius' HIT/HIE Initiative begun in Fall 2005. Earlier that year, Governor Sebelius' Health Care Cost Containment Commission (H4C) commissioned the Kansas HIT/HIE Policy initiative to develop a vision and strategy for promoting the adoption of health information technology (HIT) and health information exchange (HIE) in Kansas. Comprised of over 60 health and policy experts in the state of Kansas, the HIE group and its identified workgroups conducted a national and state review of HIE activities and policies and began developing HIE objectives for Kansas. This work culminated in the February 2007 Final Report that outlined seven core recommendations for advancing HIT/HIE in Kansas. Several of these recommendations form the basis for many of the objectives of this proposal, and include:

- Core 1 – Establish a Leadership Group
- Core 2 – Create a Public/Private Entity to Advance HIE Over the Long-Term
- Core 3 – Provide Education to All Stakeholders Regarding HIT and HIE
- Core 4 – Leverage Existing Resources and Existing Data Sources
- Core 5 – Demonstrate the Impact of HIE
- Core 6 – Resolve Privacy and Security Barriers Associated with HIE
- Core 7 – Seek Funding from Multiple Sources

These core recommendations of the HIT/HIE initiative, combined with Objective 1a above, meet the two key goals of the FCC pilot project by 1) emphasizing the development of technical health care infrastructure and 2) ensuring long-term sustainability by leveraging existing technical resources and state-level political support, while also seeking ongoing funding from multiple sources. Additional strategies for maximizing sustainability are described in the *Sustainability* section of this proposal.

Objective 1c: Employ the latest, next generation network security protocols and technologies at the network, access and application layers of KanHealth. At the network core, KanHealth will reside as a virtual routing (VR) network within the state's larger network infrastructure designed for governmental and educational purposes. VR is the newest security and routing protocol that effectively dedicates bandwidth to specific applications much like older virtual private network (VPN) technologies, yet allows for multiple private networks to communicate with each other. VR is based on the multiple label switching (MPLS) protocol that has been widely used in recent years to simplify, accelerate and secure the routing of packets by specifying paths in the network based on QoS and bandwidth needs. This reduces the transit time and increases security of the network traffic, thereby creating a private health care network.

At the application layer, the HIE Technical Workgroup developed nine domains of privacy and security solutions for ensuring the integrity of patient information and maintaining patient confidence in the system. While more detailed descriptions of these domains can be found in **Appendix B**, the domains include:

- Domain 1 – User and entity authentication
- Domain 2 – Access rights and controls
- Domain 3 – Patient and providers IDs and record locators
- Domain 4 – Information transmission security
- Domain 5 – Preserving integrity of stored information
- Domain 6 – Information systems activity audits
- Domain 7 – Administrative and physical security safeguards
- Domain 8 – State law
- Domain 9 – Information use and disclosure policies

Goal 2: Aggregate an array of existing telemedicine and HIT/HIE initiatives in Kansas within a single network by uniting regional health networks in the state and connecting hospitals and existing HIE repositories to KanHealth.

Objective 2a: Migrate existing telemedicine services to KanHealth. The Kansas University Center for Telemedicine and Telehealth has been providing a broad range of telemedicine services in Kansas since 1991. These include specialty and sub-specialty care such as cardiology, behavioral health, oncology, pediatrics, psychiatry, rheumatology and other specialties, to name only a few. These have been provided to over 60 sites in Kansas via a variety of telecommunication solutions including earlier Primary Rate Interface (PRI) lines, DSL and dedicated T1 connections. KanHealth

would effectively integrate these into a common network and protocol. In addition, Hays Medical Center in Hays, Kansas and Via Christi Health System in Wichita, Kansas have become regional telemedicine hubs for such telemedicine services as eICU and tele-stroke care. These hubs could also take advantage of a common network architecture that affords privacy and security.

Another statewide initiative that requires a private and secure network is the Midwest Cancer Alliance (MCA) administered by the University of Kansas Medical Center as part of its plan to be designated as a Comprehensive Cancer Center by the National Cancer Institute. To be implemented in Kansas in July 2007, the MCA is a model of state-of-the-art cancer care for the rural sector including telemedicine supported sub-specialty care for specific cancer disease types, access to the latest drug clinical trials for cancer patients, cancer screenings and genetic risk assessments. With the MCA tele-oncology network, Kansas cancer physicians and cancer specialists will be able to participate in live cancer care discussions from their own hospitals and offices. They will also be able to share expertise through the network for second opinions or patient diagnosis and treatment, and even drug clinical trials. KUMC seeks to expand the network to involve additional locations for telemedicine-enabled cancer care throughout the state. Initial locations that currently have oncologists locally include Emporia, Garden City, Hays, Hutchinson and Salina and will likely be the first MCA sites. Additional sites will be added as MCA membership grows and funding becomes available.

Objective 2b: Initiate HIE activity on the KanHealth network. A recent HIE assessment in Kansas resulted in responses from 74 hospitals that identified those that are in the implementation or testing phases of electronic data storage in preparation for health information exchange. Of those, about half are managing demographic and insurance information in electronic form. About one-third are also managing electronic lab results, radiology results, dictated documents and allergy information. Finally, about a quarter are treating immunizations, medication histories, medical histories and vital signs as electronic information. Another recent environmental scan conducted by the Kansas Hospital Association, identified at least 17 hospitals in Kansas that have an operational computerized physician order entry (CPOE) system and another 13 are evaluating CPOE products. In addition, 47 more are in the process of discussing and identifying vendors from which to choose. In addition, the state level Medicaid repository and disease and immunization registries are operational and available for health information exchange. Other HIE repositories are expected to come online in the next several months. The goal of KanHealth is to provide a common platform for the integration and sharing of these HIE activities for more efficient health care provision. To demonstrate the value of KanHealth, a regional set of hospitals that are ready to initiate HIE will collaborate on this project to showcase HIE workflow and outcomes.

Goal 3: Provide Internet 2 (I2) access for KanHealth participants.

Objective 3a: Leverage existing Kan-ed/KanRen relationship with Great Plains Network regional connector for I2 connectivity. Currently, the state Kan-ed network offers I2 access via a contract with KanRen, who in turn provides I2 access through the

Great Plains Network (GPN). GPN was founded in 1997 by a consortium of 20 leading universities in a seven-region of the Midwest. These states include Arkansas, Kansas, Missouri, Nebraska, North Dakota, Oklahoma and South Dakota. Current, active GPN programs of interest include bioinformatics, networking research and collaborative middleware environment. Connectivity will be achieved through GPN's gigapop connector located in Kansas City, Missouri. Consistent with I2's recent statement in support of the FCC pilot projects that will be awarded under this announcement, regional health care networks can be connected to I2 for a fee of \$25,000. Project funding for this proposal will be allocated to this cost. Additional funding will be allocated for KanRen's subcontract costs for providing KanHealth access to I2.

Goal 4: Demonstrate effectiveness of the network through analysis of "real-time" network efficiencies realized for statewide patient care and data exchange.

Objective 4a: Demonstrate typical "use case" scenarios identified by the HIE Clinical Workgroup as an initial data set for implementation and analysis on KanHealth. The HIE Clinical Workgroup outlined six use case scenarios that Kansas clinicians named as being central to more effective health care in Kansas. These are to be implemented by prescribed dates as determined by the HIE Technical Workgroup. These six scenarios describe typical clinical data sets and represent standards that can be aligned with regional and national data standards. The six identified data sets to be initialized with this pilot project are:

- Use Case 1 – Electronic Registration/Demographics
- Use Case 2 – Medication History and Diagnosis
- Use Case 3 – Allergy History
- Use Case 4 – Laboratory and Radiology Ordering and Results Delivery
- Use Case 5 – Immunizations
- Use Case 6 – Electronic Health Record (EHR) – Patient Health Summary

A significant number of hospitals that will participate in this pilot project are in the operational phase of having these sets available for exchange, particularly Electronic Registration and Laboratory/Radiology, and will be involved in the data exchange demonstration of this pilot.

Objective 4b: Integrate an efficient workflow model for patient referral, treatment and information exchange. While KanHealth will be robust and technologically capable of high bandwidth data for health care purposes, the organizational issues need to be developed that support a technology-enabled, seamless system for patients and providers. A work flow study that describes information flow within and between hospitals and clinics while authenticating information users is necessary to optimize network efficiencies and develop organizational strategies. Multiple level telemedicine services and data repositories will be accounted for in this analysis. These include videoconference-based and store-and-forward telemedicine applications and statewide Medicaid, immunization and disease registries. The planned work flow study will track

a patient's information and treatment from referral through the data gathering, follow-up and reporting stages.

Goal 5: Develop a health network sustainability model based on public-private partnership that will contribute to long-term funding of the network and increased network utilization.

Objective 5a: *Require telecommunication providers to offer “bundled content” on hospital last mile connections for enhanced digital services and added value of the local network loop.* Consistent with how broadband internet services and cable television are provided and sustained in the U.S. residential model through a tiered-services structure, health care services would be bundled in a similar fashion for the health care model proposed here. Each local hospital that requests connectivity to KanHealth for health care purposes would partner with the local telecommunication provider to identify the level of service required for its local loop to KanHealth. Digital services may include internet one (I1) access, internet 2 (I2) access, long distance service, health information exchange with statewide repositories, video applications including telemedicine, and other advanced services requiring high bandwidth and security. Local telecommunication providers will manage the premise equipment and routing requirements while offering a bundled rate for the local connection to KanHealth. Health care related network traffic will route securely through KanHealth while non-health related traffic will route to I1 or other destinations. For a more thorough description of the local access loop options and routing schemes, please see **Appendix C**.

Objective 5b: *Enhance network sustainability and utilization through content bundling.* Based on the market-driven residential model described above, available services are based on customer needs and are thus supported by the customer and the telecommunication providers. Extending this concept to technology-enabled health care services will compel local community hospitals to identify their broadband needs and work with local telecommunication companies to offer those needs at competitive pricing. As with residential broadband and cable television, bundling of services may increase overall pricing of the access but reduce the unit cost of the services thereby increasing value to the customer. Thus, the customer receives the requested services, pays for them and is more likely to use them. For KanHealth, telecommunication providers will bundle access to statewide patient and data repositories through the local loop, thus sharing some of the initial integration costs. Moreover, participating local hospitals have expressed a desire to access these data and are willing to pay a premium to do so. These mechanisms will reduce the overall costs of KanHealth and ensure long-term sustainability through a market-driven, business model approach for providing health information services.

Goal 6: Establish an organizational structure for long-term governance and administration of KanHealth.

Objective 6a: *Ensure a seamless transfer of KanHealth management from the KanHealth Advisory Committee during the pilot phase to a separate 501(c)3 entity after*

pilot funding ends. Currently in Kansas, Kan-ed and other existing networks are organized under the Kansas Board of Regents or other state agencies, none of which are identified as health care oversight agencies. However, the Kansas Health Policy Authority (KHPA), a state agency formed in July 2005 is the governing body for the majority of the health care oriented segments of Kansas government, such as Medicaid, Kansas Department on Aging and the health information exchange commission. The KHPA is also the home of Kansas Governor Sebelius' Health Care Cost Containment Commission (H4C) which is charged with reducing health care costs and increasing efficiencies in Kansas. Consistent with these efforts, it is the KHPA that is the most logical state agency for administering a health care network dedicated to providing improved access to care, more efficient health care technologies and health information exchange. Ultimately, the formation of an HIE resource center as a separate 501(c)3 that reports to the Health Policy Authority will be the best solution and will be pursued during the pilot phase of this project.

III. Estimated Network Costs per Year

The estimated cost of the network per year is approximately \$1,691,000. This figure includes the cost of the leases and management of the network “core” that includes 19 nearest access points (NAPs) as constructed with Juniper M7 routers. For this portion of KanHealth, the total is \$875,000 per year. Another component of the total annual cost is the expense associated with 80 “last mile” loops to the core network for participating hospitals in the pilot project. This figure amounts to \$816,000. In addition to these annual costs, one time costs associated with premise router purchase and installation, network design and workflow studies and award distribution costs raise the total cost of the project to \$3,972,000 over a two-year period. A simple breakdown of these expenses and the required match is included in **Table 1** below.

Table 1: Simple 2-year total budget for proposed project

KanHealth “core” costs	\$1,750,000	\$317,745
KanHealth “last mile” loops	\$1,224,000	\$216,000
Premise Router, Install & Management at sites	\$204,000	\$36,000
Network Design Study	\$250,000	N/A
Internet2 Connection Fee	\$25,000	N/A
Project Management	\$345,300	N/A
Totals	(85%) \$3,798,300	(15%) \$569,745
	Project Total Budget	\$4,368,045

IV. For Profit Hospitals – How they will pay?

Currently, no for-profit hospitals plan to participate in the project during the pilot phase, though all hospitals and other health care providers in Kansas will ultimately be eligible for connection to KanHealth. While there will not be a membership fee associated with connection to the

KanHealth network, for-profit hospitals and clinics will be required to pay their own connection, routing and infrastructure management costs if they choose to utilize KanHealth for telemedicine or health information exchange. These costs will consist of the fees for the “last mile” connection, or access layer, of the network and will be negotiated with the local telecommunications provider. The cost-per-site will vary depending on local telecommunication rates, distance from the nearest access point (NAP) and requested level of services.

V. Identification of Financial Source for Costs not Covered by the Fund

Because KanHealth is a network that will be segmented from existing state networks, it is currently indirectly supported by State of Kansas funding that is allocated to the Kan-ed network in Kansas. Thus, state Kan-ed dollars will be used as matching funds for the purpose of this two-year project in the amount of \$317,745, or roughly 8% of the total project budget. In addition, participating hospitals will be required to provide a local match of approximately 7% of the total budget of this project, or \$252,000. This figure represents the cost of the local loop connection to the KanHealth network, a premise router, and router installation and management. Across the 80 hospitals that will participate in this project, each will contribute \$175 per month for the 18 months that they are connected to the KanHealth.

VI. Health Care Facilities Included in the Network

KanHealth will be initially configured with the **44** hospitals listed in Table **2** below, 31 of which are designated as Critical Access Hospitals (CAHs). These are also depicted in the map of Kansas in Figure **1**. FCC/USF funding will be allocated to the “last mile,” or access layer costs of the network including premise routers and routing management by the local telecommunication provider for the last 18 months of the two-year funding period.

During the pilot phase of this project, another **36** hospitals will be included in the network for participation and will be chosen on a first come, first-served basis. These hospitals will be identified by completion of a hospital assessment that was developed by members of the FCC planning committee that identified hospitals’ connection needs, planned utilization and expected level of local financial support for KanHealth. With this additional group of participating hospitals, a total of 80 facilities will be included in the pilot phase of this project. The total budget for the project was calculated on this figure.

Ultimately, any health care facility or service provider in Kansas will be eligible for connection to the KanHealth “core” network. USF eligible entities will have their local connection discounted according to the current USF mechanism, while for-profit and other ineligible entities will be required to support to full cost of their KanHealth local connection.

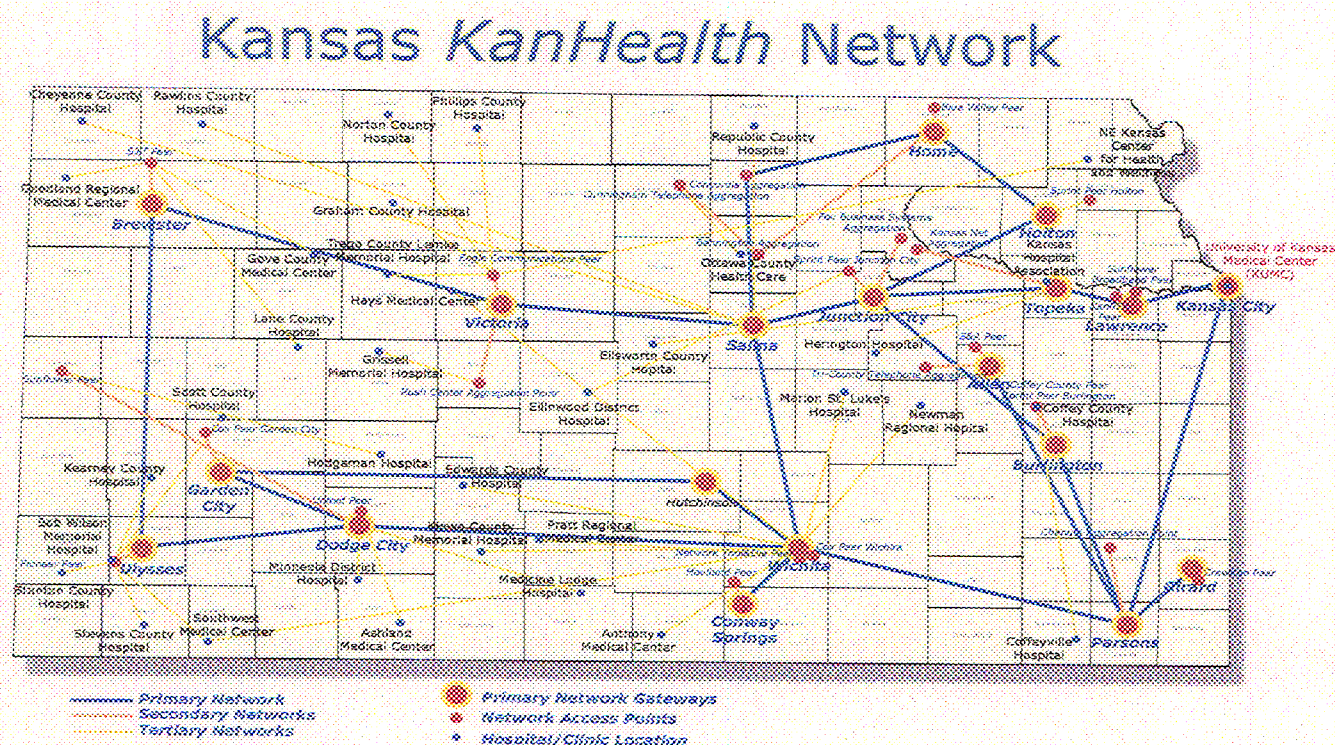
Table 2: Initial group of hospitals to be included in KanHealth network.

Keamy County Hospital	500 Thorpe St Lakin, KS	67860-0744	(620) 355-7111	10.5	Yes
Stanton County Hospital	404 N. Chestnut St., P.O. Box 779 Johnson, KS	67855-0779	(620) 492-6250	10	No
Grisell Memorial	210 S. Vermont Ave. Ransom, KS	67572	(785) 731-2231	10	Yes
Goodland Regional Hospital Dist. #1	220 W. Second St Goodland, KS	67735-1602	(785) 890-3625	7	Yes
Scott County Hospital	310 E. Third St. Scott City, KS	67871-1203	(620) 872-5811	7	Yes
Ellsworth County Hospital	1604 Aylward St. P.O. Box 87 Ellsworth, KS	67439-0087	(785) 472-3111	7	Yes
Kiowa Memorial Hospital	501 S. Walnut P.O. Box 616 Greensburg, KS	67054-0616	(620) 723-3341	10	Yes
Newman Regional Hospital	1201 W. 12th Ave. Emporia, KS	66801-2597	(620) 343-6800	4	No
Ottawa County Health Center	215 E. Eighth P.O. Box 290 Minneapolis, KS	67467-0290	(785) 392-2122	10.5	Yes
St. Luke's Hospital	12300 Metcalf Ave. Overland Park, KS	66213	(913) 317-7904	1	No
Sedan City Hospital	300 North St. P.O. Box C Sedan, KS	67361-0427	(620) 725-3115	10	Yes
Hamilton County Hospital	700 E. Huser St. P.O. Box 948 Syracuse, KS	67878-0909	(620) 384-7461	10	Yes
Bob Wilson Memorial Hospital	415 N. Main St. Ulysses, KS	67880-2133	(620) 356-1266	7	NO
Trego County- Lemke Memorial Hospital	320 N. 13th St. WaKeeney, KS	67672	(785) 743-2182	10	Yes
Cheyenne County Hospital	210 W. First St., P.O. Box 547 Saint Francis, KS	67756-0547	(785) 332-2104	10	Yes
Graham County Hospital	304 W. Prout St., P.O. Box 339 Hill City, KS	67642-0339	(785) 421-2121	10	Yes
Hays Medical Center	2220 Canterbury Hays, KS	67601	(785) 623-5000	4	No
Lane County Hospital	235 W. Vine, P.O. Box 969 Dighton, KS	67839-0969	(620) 397-5321	10	Yes
Ellinwood District Hospital	605 N. Main Ellinwood, KS	67526-1440	(620) 564-2548	10.2	Yes
Anthony Medical Center	1101 E. Spring St. Anthony, KS	67003-2122	(620) 842-5111	10	No
Herington Municipal Hospital	100 E. Helen Herington, KS	67449-1606	(785) 258-2207	10.5	Yes
	1400 W. Fourth				

Coffeyville Hospital	Coffeyville, KS	67337	(620) 251-1200	4	No
Stevens County Hospital	1006 S. Jackson, P.O. Box 10 Hugoton, KS	67951-0010	(620) 544-8511	7	Yes
St. Catherine Hospital	401 E. Spruce St. Garden City, KS	67846-5679	(620) 272-2222	4	No
Kansas University Medical Center	3901 Rainbow Kansas City, KS	66160	(913) 588-1270	1	No
Minneola District Hospital Dist #2	212 Main, P.O. Box 127 Minneola, KS	67865-0127	(620) 885-4264	10.5	Yes
Norton County Hospital	102 E. Holme, P.O. Box 250 Norton, KS	67654-0250	(785) 877-3351	7	Yes
Hodgeman County Health Center	809 W. Bramley, P.O. Box 310 Jetmore, KS	67854-0367	(620) 357-8361	10.5	Yes
Kansas Hospital Association (KHA)	215 SE 8th Avenue Topeka, Kansas	66603-3906	(785) 233-7486	N/A	No
Republic County Hospital	2420 G St. Belleville, KS	66935-2400	(785) 527-2254	10	Yes
Clara Barton Hospital	250 W. Ninth Hoisington, KS	67544-1706	(620) 653-2114	5	Yes
Rooks County Health Center	304 S. Colorado Plainville, KS	67663-2505	(785) 434-4553	10.5	Yes
Meade District Hospital	P.O. Box 820, 510 E. Carthage Meade, KS	67864-0820	(620) 873-2141	10	Yes
Medicine Lodge Hospital	710 N. Walnut Medicine Lodge, KS	67104-1019	(620) 886-3771	10	Yes
Rawlins County Hospital	P.O. Box 47, 707 Grant St. Atwood, KS	67730-0047	(785) 626-3211	10	Yes
Gove County Medical Center	520 W. Fifth, P.O. Box 129 Quinter, KS	67752-0129	(785) 754-3341	10	Yes
Edwards County Hospital	620 W. Eighth, P.O. Box 99 Kinsley, KS	67547-0099	(620) 659-3621	10	Yes
Coffey County Hospital	801 N. Fourth St., P.O. Box 189 Burlington, KS	66839-0189	(620) 364-2121	7	No
Smith County Memorial Hospital	614 S. Main St., P.O. Box 349 Smith Center, KS	66967-0349	(785) 282-6845	10	Yes
Phillips County Hospital	1150 State St., P.O. Box 607 Phillipsburg, KS	67661-0607	(785) 543-5226	7	Yes
NE KS Center for Health and Wellness	240 W. 18 th Horton, KS	66439	(785) 486-2642	10.6	Yes
Southwest Medical Center	315 W. 15 th St., P.O. Box 1340 Liberal, KS	67905-1340	(620) 624-1651	4	No

Pratt Regional Medical Center	200 Commodore Pratt, KS	67124-3099	(620) 672-7451	7	No
Russell Regional Hospital	200 S. Main Russell, KS	67665-2997	(785) 483-3131	7	Yes

Figure 1: Map of Kansas with KanHealth infrastructure and initial set of hospitals



VII. Previous Experience in Development and Management of Telemedicine Programs

This project leverages the operational and clinical expertise of one of the earliest and most successful telemedicine programs in the United States, the Kansas University Center for Telemedicine and Telehealth (KUCTT). The KUCTT has considerable experience in implementing and evaluating telemedicine, telehealth and HIT applications. To address the shortage of specialty care in rural areas, the KUCTT began the development of a statewide telemedicine infrastructure in 1991 by making its first connection with Hays, Kansas, over 280 miles away. That telemedicine connection was used to deliver the first known pediatric telecardiology consultations in the US⁴. Today, the network has grown to over 60 rural sites throughout the state that receive specialty and sub-specialty medical care across the lifespan. Today, the program provides most clinical specialties, with oncology, mental health, cardiology and pediatrics comprising the majority of the patient volume. More recently, innovative clinical

⁴ Mattioli L, Goertz K, Ardinger R, Belmont J, Cox R, Thomas C. Pediatric cardiology: auscultation from 280 miles away. *Kans Med.* Dec 1992;93(12):326, 347-350.

services such as an amyotrophic lateral sclerosis (ALS, or Lou Gehrig's disease) clinic, tele-stroke care and a wheelchair seating clinic have been initiated.

Though KUMC is the primary hub of telemedicine in Kansas, Hays Medical Center has recently provided hub services for cardiac rehabilitation and home monitoring to several hospitals in its region. In addition, Via Christi Health System in Wichita is now providing tele-stroke and eICU services in its region. More hubs may emerge in coming years, as a positive climate exists in Kansas for the continued expansion of telehealth. The implementation in 2004 of a Medicaid policy for the reimbursement of telemedicine in Kansas and the January 2007 introduction of HB2065 requiring all private insurers to reimburse for telemedicine improves the long-term outlook for telemedicine in the state.

The KUCTT is led by **Ryan Spaulding, PhD** who is also the administrator of this proposed FCC pilot project. Dr. Spaulding has over six years' experience in designing and implementing telemedicine focused projects and research studies. He is currently the co-investigator of the Center's Office for the Advancement of Telehealth (OAT) grant from the Health Resources and Services Administration with PI Gary Doolittle, MD, a project designed to provide a comprehensive cost-benefit evaluation of telemedicine across multiple specialties and originating sites. Dr. Spaulding also was the co-investigator of the KUCTT's previous OAT grant from 2000-2003 that studied patient and provider perceptions of telemedicine, including both rural and urban health care providers' views of operational and clinical issues surrounding its adoption. Through his efforts with Kansas Medicaid officials in 2003, Dr. Spaulding was able to procure a telemedicine reimbursement policy from Kansas Medicaid that became effective in August 2004. Closely mirroring the federal Medicare policy for telemedicine reimbursement, the Medicaid reimbursement in Kansas will make telemedicine more sustainable in the long-term. He has been active in developing new telemedicine projects such as a recent tele-pathology project and a new home telehealth project in Coffeyville, Kansas. He has also been active in telehealth advisory committees such as the inaugural board of the Center for TeleNursing at Texas Women's University in Houston, Texas and his advisory role with Kan-ed in Kansas. Dr. Spaulding has organized the following team of state leaders to conceptualize and implement this FCC pilot project.

Karen Braman, RPh, MA – Ms. Braman is the director of pharmacy services at Preferred Health Systems after leaving the Kansas Health Policy Authority in late February 2007. As the Director of Quality and Innovation for the Kansas Health Policy Authority, Ms. Braman administered all state health information exchange initiatives. After a successful statewide health information exchange initiative in 2005, Governor Sebelius created the Health Information Exchange Commission to advance HIT/HIE in Kansas and has appointed Ms. Braman as co-chair. Prior to working for the Authority, Ms. Braman was Deputy Director of the Governor's Office of Health Planning and Finance. Ms. Braman is a licensed pharmacist and holds a Master's degree in pharmacy practice administration. She has over 15 years of experience in the health care industry, including ten years with publicly funded health programs. Over the last several years, Ms. Braman has focused primarily on researching and analyzing state health policy issues, including prescription benefits management, health and wellness and health information exchange. Ms. Braman will serve as a liaison with the Health Policy Authority and Governor's office for this project.

Charmine Chambers - Ms Chambers currently serves as the Kan-ed Network Access Manager for the Kansas Board of Regents. In this role, she coordinates constituent access to the Kan-ed Network by managing service requests, matching customer needs with available technologies and initiating telecommunication solutions with the local telecommunication providers. Ms Chambers also coordinates communications and operations between constituent members, the Network Operations Center (NOC) and local telecommunication providers for the generation of connection orders and service initiation. For the proposed project, Ms Chambers will administer the migration of hospitals connections from Kan-ed to KanHealth, as well as all connection needs for new hospital or health care members to the KanHealth network.

Gary C. Doolittle, MD – Dr. Doolittle is the Medical Liaison to the Kansas University Center for TeleMedicine & TeleHealth and is one of the world’s leading authorities on the development and implementation of telemedicine services. As a medical oncologist and telehealth physician, Dr. Doolittle has conducted over 3,000 telemedical visits evaluating and managing patients with a wide variety of hematologic and oncologic disorders. He has been instrumental in the expansion of the Kansas Telemedicine Project through the development and establishment of additional services including tumor boards, patient education and support groups, and continuing educational events for nurses and physicians. Working as a hospice medical director, he launched one of the first telehospice projects in the country, utilizing home-based telemedicine units to improve care for patients at the end-of-life. Dr. Doolittle is principle investigator for several grants funded through the Technologies Opportunities Program of the Department of Commerce and the Office for the Advancement of Telehealth. He has authored numerous publications concerning telemedicine delivery, teleoncology, telehospice, cost tracking, and patient acceptance.

Jerry Huff, JD, MCSE – Mr. Huff currently serves as the Kan-ed Director of Business Operations and Planning for the Kansas Board of Regents where he manages all financial and budgetary issues of the Kan-ed organization and network. Previously he held joint positions as an attorney and privacy officer for both Blue Cross and Blue Shield of Kansas and Stormont Vail Healthcare Systems in Topeka, Kansas. For the current project Mr. Huff will manage all funding allocated to Kan-ed for network, personnel and operating expenses.

Melissa Hungerford – Ms Hungerford is the Executive Vice President of the Kansas Hospital Association (KHA). Ms. Hungerford has been with the Association for over 25 years and manages the Association’s Health Information Technology Technical Advisory Group. In addition, she has served on the Governance Committee of the Kansas HIE initiative and in advisory capacities for several of the HIT related activities in the state, including the RTI Privacy and Security project, the Advanced ID Card project and the Health Care Cost Containment Commission. The Kansas Hospital Association represents community hospitals throughout the state, including the state’s 83 Critical Access Hospitals.

Rose Mulvany-Henry, JD – Ms Henry is a telecommunications attorney with Boulton Cummings Connors & Berry, PLC. She has served on the Finance Workgroup for the Kansas HIT/HIE Policy Initiative due to her extensive background in telecommunications and federal communications regulatory issues. Ms Henry’s experience on the Finance Workgroup has given her a keen understanding of how advanced telecommunications services and policies interface

with health information technologies, particularly in the state of Kansas. For the current proposal, she has assisted with interpreting the FCC order based on her experiences with the FCC and KCC and has offered guidance on developing a project that falls within University Service Fund and other regulatory requirements. Ms Henry will continue to advise the committee on current and future regulatory issues that will affect telecommunications and networking as it relates to health care in Kansas.

Randy Stout, MTS – Mr. Stout is the Director for Research & Development with the Kan-ed Network at the Kansas Board of Regents. In this role Mr. Stout has developed multiple initiatives with health care organizations, educational agencies and institutions in elementary, secondary, and postsecondary programs, and public libraries. He has successfully navigated within the state’s systems of institutions and with national programs through active participation in Internet2 and K20 Advisory Committee. Through these efforts, he has been involved in research and development efforts that exemplify best practices and that identify promising innovations. In addition, Mr. Stout serves as chair and participates on several advisory committees and working groups to help coordinate multiple initiatives building information technology and telecommunications infrastructure and resources for health care, education, and libraries. For this pilot project, he will: (1) seek to develop exemplary and innovative telehealth and telemedicine practices in the network; (2) coordinate with the chair to support activities for the interconnect council; and (3) serve as liaison with Internet2/NLR in the appropriate councils and advisory groups.

Chris Tilden, Ph.D. – Dr. Tilden is the Director of the Office of Local and Rural Health (OLRH) in the Kansas Department of Health and Environment (KDHE). Dr. Tilden’s office has been a key facilitator for telemedicine activity in the state, developing a “primer” for rural health providers in the early 1990s and continuing to sponsor workshops on telemedicine in collaboration with KUMC and other partners. Most recently, Dr. Tilden served on a HIT/HIE steering committee under the Lieutenant Governor’s Health Care Cost Containment Commission. He also served as project director for a Robert Wood Johnson “Information Links” grant to look at public health linkages with emerging Regional Health Information Organizations. OLRH provides technical assistance and education to rural health care providers around the state through a number of programs including the Rural Hospital Flexibility Program (also known as the Critical Access Hospital Program), the state Trauma Program a Primary Care Clinic grant program, and through liaison activities with rural health clinics, local health departments and others. OLRH will serve as a conduit for information about the pilot project to rural constituents and will assist KUMC in facilitating all discussions about network development.

VIII. Project Management Plan

Table 3: Proposed 2-year timeline for project.

Network design study and posting of Form 465	Implementation of engineering findings, network construction and routing	Migration of hospitals to KanHealth network	Additional health providers added to network; HIE and workflow demonstration

Phase I - Upon receipt of a pilot project award, Dr. Spaulding will: 1) begin preparing the USF Form 465 for the receipt of funding under the current USF mechanism and 2) coordinate a network design study to be conducted by Kan-ed and KanRen network engineers to confirm and adapt the technological solution proposed in this project. This engineering study will establish the technical platform to implement the newest security and routing protocol known as virtual routing. Virtual routing is a networking standard that effectively dedicates bandwidth to specific applications much like virtual private network (VPN) technologies, yet allows for multiple private networks to communicate with each other. Virtual routing is based on the multiple label switching (MPLS) protocol that has been widely used in recent years to simplify, accelerate and secure the routing of packets by specifying paths in the network based on QoS and bandwidth needs. This reduces the transit time and increases security of the network traffic, thereby creating a private health care network.

Timeline: 3 months for engineering study and subsequent posting of Form 465 for competitive bid.

Cost: \$250,000

Phase II – After the 28 day bidding period for the project closes, the KanHealth Advisory Committee will review and select the winning bid for the KanHealth infrastructure. Once selected, the telecommunication provider will coordinate with the Network Operations Center (NOC) and with Charmine Chambers of Kan-ed to construct the network core to the technical specifications outlined in the engineering study. This will include the purchase and installation of core routers and virtual routing protocols. Phase II will also include re-configuring the routing tables within the virtual routing protocol for routing through KanHealth or out to Internet 2.

Timeline: 3 months for completion of subcontracts, network construction, configuration and testing.

Cost: \$1,750,000 + \$25,000 (I2 connection fee)

Phase III – As the core of KanHealth is being constructed, configured and tested, the 44 hospitals listed above that are currently connected to Kan-ed will be migrated to KanHealth. This process will require the implementation of Layer 3 peering arrangements between KanHealth nearest access points (NAPs) and local telecommunication providers. As described earlier, local telecommunication providers will manage the access layer of the network by providing and managing the premise router required for access to KanHealth and other services, such as Internet 1. Charmine Chambers of Kan-ed will also coordinate and manage this Phase of the project.

Timeline: 12 months for implementation of all Layer 3 peering arrangements and migration of hospitals to the network.

Cost: \$1,428,000

Phase IV – In Phase IV, the HIE workflow will be demonstrated with 1 or more regional health care networks in Kansas. This demonstration will occur through the KanHealth network and will include HIE security, safety and workflow.

Timeline: 6 months for workflow study implementation and demonstration,

Cost: N/A

IX. Coordination of Telemedicine Program – Geographically

The Kansas University Center for Telemedicine and Telehealth has been successful for a number of years in coordinating a statewide telemedicine program. This is accomplished through several long-standing mechanisms. First, the Center employs a number of project managers who **are** skilled at developing and sustaining telemedicine sites through ongoing communication and training. Second, each site is required to identify a site coordinator who becomes familiar with all aspects of the telemedicine service including patient referral, scheduling, patient presentation, basic technical troubleshooting and general coordination. Third, Kansas University Medical Center has three Area Health Education Centers (AHEC) that **serve** as telemedicine sites and clinical outreach centers. These are strategically located in Garden City, Hays and Pittsburg, Kansas, thus covering the three basic regions of the state. Each AHEC has staff dedicated to telemedicine training and operations for its specific region.

In addition, the KanHealth Advisory Committee convened for this project consists of state leaders with wide reach in Kansas for initiating and maintaining health care projects. Kan-ed, Kansas Hospital Association and Kansas Department of Health and Environment all have statewide responsibility for networking, health care programs and advocacy that can be leveraged for this project. These organizations all have regional representatives for their respective areas of expertise that can be effectively organized for management of the telemedicine project as needed.

Finally, the local loop of the KanHealth network for each participating hospital will be locally managed by the community telecommunications provider. This will reduce the need to centrally manage each and every site included in the network. Instead, telemedicine and HIE operations can be managed by the KUCTT and HIE Commission, while the network core can be centrally managed by Kan-ed. In short, the telemedicine program has excellent coordination mechanisms in place that will provide robust project management across a wide geography.

X. Extent to Which Network can be Self-Sustained Once Established

Table 4 contains the forecasted sustainability breakdown. At the conclusion of FCC pilot project funding, KanHealth will be fully sustained by three existing funding mechanisms. First, the bulk of the project costs--\$2.06 million for the KanHealth “core” network—will revert to the Kansas Universal Service Fund (KUSF) which has been leveraged for the last six years for the Kan-ed network in Kansas. This funding stream has been approved by the Kansas Legislature

since the inception of Kan-ed in 2001. The \$25,000 annual Internet2 connection fee will also continue to be supported by KUSF funding.

Second, the local hospital connections, or “last mile” loops to the KanHealth nearest aggregation point that total \$1.22 million in this project will be partially supported by the existing Rural Health Care mechanism of the Universal Service Fund. Preliminary data from an April 2007 survey of Kansas hospitals indicated that 64% of respondents do not apply for USF discounts for their telecommunication services. During the pilot phase of this project, processes will be developed to improve the rate of participation in the USF program and reduce hospital costs. Latest figures show that the 2007 urban rate for a T1 MTM in Kansas is \$370 representing a discount of approximately \$796.67 from the average cost of \$1 166.67 per site, per month used in developing the budget for this pilot. Thus, the total cost of the local loops, the premise routers and router management will be discounted by USF by a total of \$1,147,205. Because the total cost of the local loop portion of KanHealth amounts to \$1,680,000, the remaining balance after USF discount is \$532,795.

Third, the remaining portion of the local loops, or \$532,795, will be supported by the local match of the participating hospitals. Each hospital will be paying approximately \$370 per month for its KanHealth connection. Because the hospital will have access to telemedicine, HIE activity, distance education and other health technology services, this is viewed as an affordable and necessary expense to incur that will reduce other hospital expenses. Note: The \$532,795 amount is based on an 18-month period to be consistent with the period identified in this pilot proposal in which hospitals are connected to the network. On an annual basis, the amount is actually \$355,200, which still averages \$370 per month per hospital.

The remaining expenses in this pilot project for the network design study (\$250,000) and the project management costs (\$345,300) are one-time figures and will not require ongoing resources.

Table 4: Sustainability breakdown

KanHealth Core	Kansas USF	\$2,067,745	55%
KanHealth Local Loops (USF/RHC portion)	USF/RHC	\$1,147,205	30%
KanHealth Local Loops (local hospital portion)	Local hospital match	\$532,795	14%
Internet2 Connection	Kansas USF	\$25,000	1%
Totals:		\$3,112,145	100%

XI. Requested USF/RHC Mechanism Exceptions

This proposal is the result of several months of discussions among state leaders who want to advance the quality and efficiency of health care in Kansas. Based on the latest available information regarding this FCC pilot and the health care and networking environments in Kansas, it is the best approximation of the advisory committee’s vision for telemedicine and health technology in the state. However, due to the lack of clarity in some sections of this pilot program announcement, it was challenging to develop a clean proposal that meets the needs of

the state of Kansas while also matching the requirements of the current USF mechanism. For example, though the FCC will provide funding that allows applicants to conduct a ‘network design study’ (page 2, FCC 06-144), it is difficult to budget for this without knowing how these funds will be allocated from the existing USF mechanism. In addition, though academic medical centers are the organizations that most commonly maintain active telemedicine programs in most states, this order does not allow for university “indirect” expenses even though the cost of administering this type of two-year project could be substantial. In fact, it is atypical for a university to allow for this type of project application without a minimum level of support for project management. Often, proposals for innovative and important projects do not get submitted at all when indirects are not allowed. Because of these and other limitations to the current USF mechanism, the following exceptions are requested for full implementation of this proposal

Exception 1: Allow “direct” funding for the purposes of conducting an initial network design study. For this proposal, a total of \$250,000 is allocated to this component.

Exception 2: Allow for “indirect” funding for the costs associated with effectively managing this project. Though the typical rate for federal projects has been negotiated at 47%, the Kansas University Medical Center Research Institute (KUMCRI) has agreed to reduce this rate to just 10% of the total budget for this pilot. Thus, \$345,300 is requested for project management. These indirects are allocated to the cost associated with the distribution of awarded funds, any necessary subcontracting, federal government reporting requirements, project administration and navigation of USF application procedures.

Appendix A – Network Design/Engineering Study to Resolve Access Layer Configuration

As described in **Objective 1a** above, an engineering study is necessary to resolve the most effective access layer solution for KanHealth. In short, the best method for ensuring both security and end-user flexibility with the network using the latest networking tools will be determined. This is necessary because Kan-ed has historically operated with two methods of site connection. The first is the traditional WAN networking methodology in which a data circuit is placed between the site and the Kan-ed backbone. In this model, the circuit is essentially a "private line" in which all data placed on it is simply transported to the opposite end without inspection or manipulation. The technologies used include TDM, point-to-point, FrameRelay and ATM -- all considered private and secure solutions, even by stringent standards such as HIPAA. This method also ensures maximum control and visibility as the only two entities involved in actual data transfer are the end site and Kan-ed. This method, however, did become considerably more complicated when the issue of Internet 1 service was added. With a private connection to a private network (Kan-ed), this required the site to install completely separate connectivity for Internet service. This then led to the existence of two off-network connections for the end site and routinely required the end site to either connect users on their LAN to Kan-ed OR to the Internet, but not both. Newer methods do exist to mitigate the primary problem with this method and allow both Kan-ed and Internet connectivity while maintaining a "traditional" ISO Layer 2 circuit connection to the end site. Please see **Figure 2** below for a graphic depiction of this model.

As illustrated in **Figure 3** below, the second possible method was primarily employed to mitigate the "Internet issue" of how to access both Kan-ed and the Internet on the local LAN as well as preserving the local provider's existing networking methods and revenue streams. Kan-ed has heavily promoted this concept for approximately 1.5 years and has spent that time urging all providers to shift to this solution. In this method, the partner provider connects to Kan-ed as an autonomous system with a standard AS boundary. Kan-ed in this scenario becomes little more than a transit backbone offering a way for connected Kan-ed members to reach each other without using the commodity Internet. Routing environments are isolated by the provider to ensure that only their Kan-ed customers have access to Kan-ed. The promise of this model was complete non-interference into the autonomy of the provider partner's networking operation, allowing them to provide both Internet and Kan-ed backbone access on the same last-mile resources to the site, thus further reducing one-time and recurring charges.

While this autonomous system peering (ISO layer 3 method) provides a very clean demarcation keeping Kan-ed out of the local market, it suffers from two major drawbacks. The first is that, from a high level, Kan-ed is only as capable as the least capable peered partner. Significant roadblocks have been encountered with both provider capabilities and provider willingness to advance them. Advancing capabilities means expenditure of resources and often, this is not cost-effective for the providers. Furthermore, many of the providers are small-scale operators that are not even multi-homed and lack sufficient experience and understanding to realize what it means for Kan-ed to be a transit backbone. Simply put, they see Kan-ed as another downstream customer rather than a lateral or upstream peer, and as such fail to realize that custom

implementations will affect all other peers. The second limitation is only pertinent to this particular discussion, which is to create a private healthcare network. While passing IDL/videoconferencing traffic through the peer networks at ISO layer 3 does not represent a problem, it does pose challenges for creating a truly secure, private network. While the traffic is passing through the provider partner's network layer environment, neither Kan-ed or the site have any visibility or control of the data flow -- it is not simply a "pipe" with this model.

Figure 2: Layer 2 peering arrangement

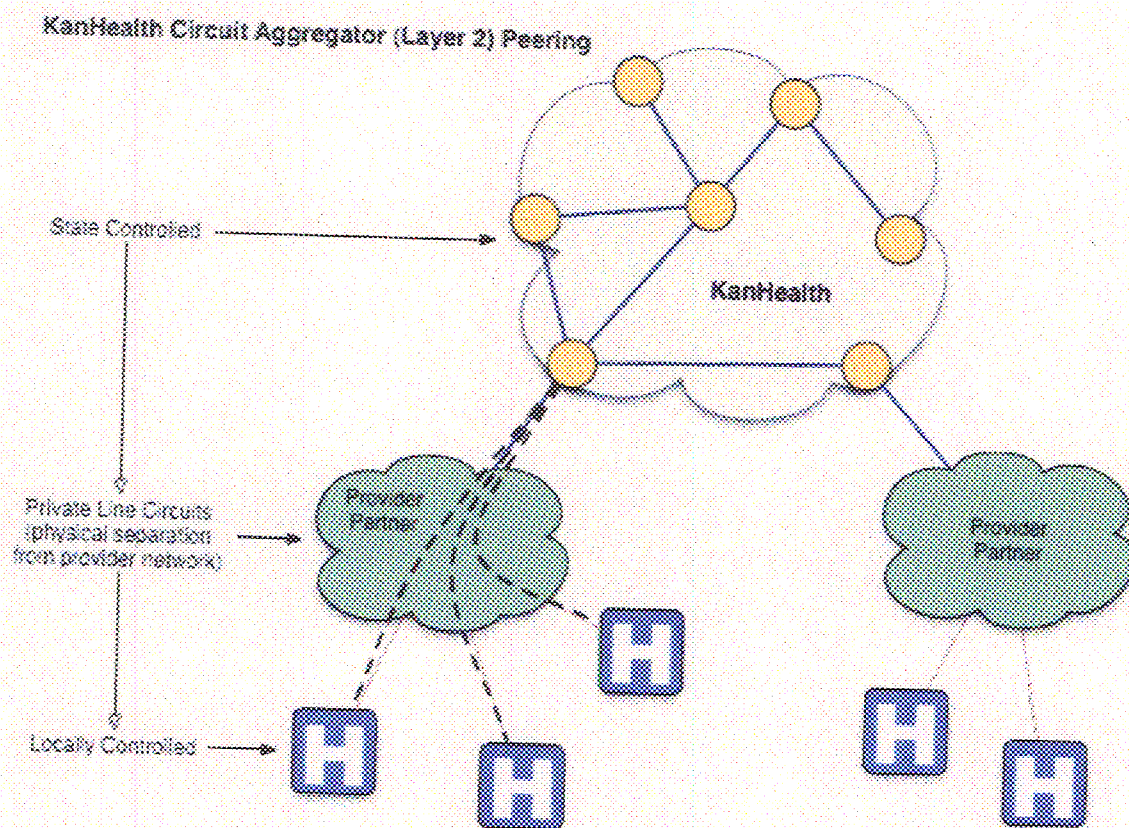
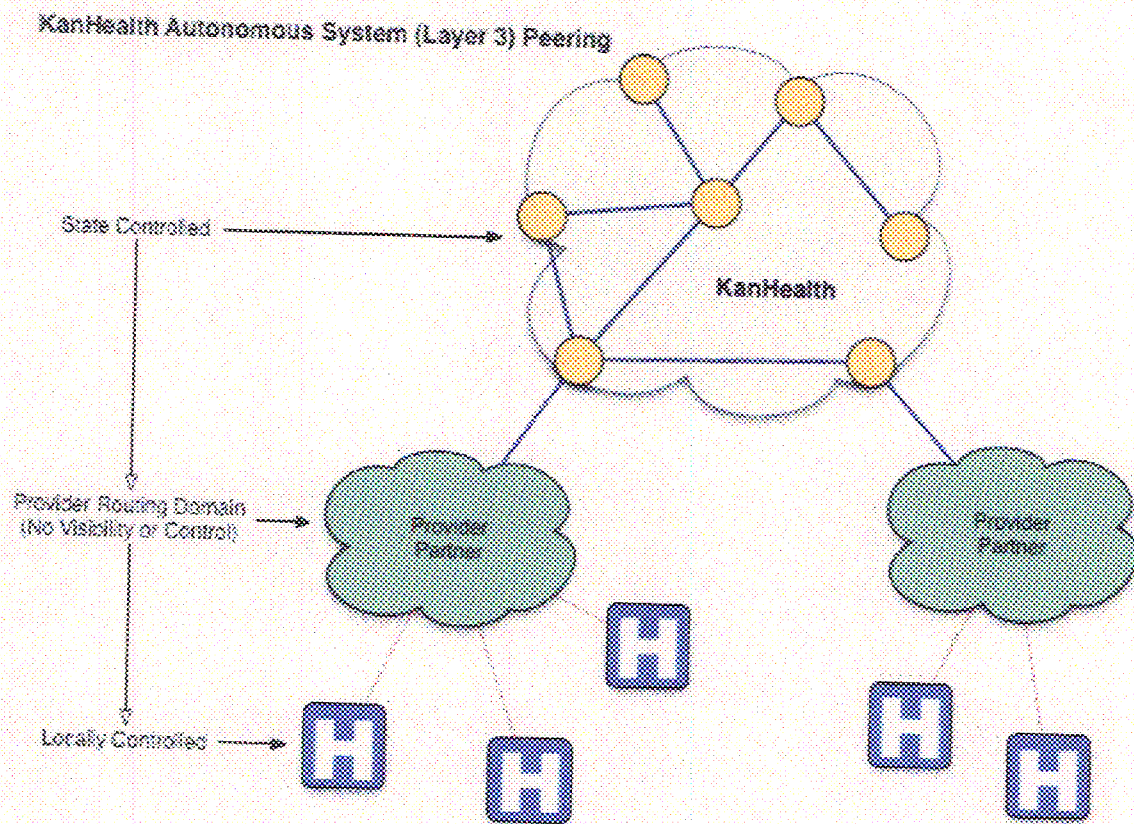


Figure 3: Layer 3 peering arrangement



Appendix B – Network Security⁵

Domain 1: User and entity authentication

Solution 1.1: Development of a standardized definition and process to determine user identity and authentication at the level of patient, provider, payor, government, and other administrative persons/entities.

Solution 1.2: Require a multiple level process of authentication. At a minimum authentication should be a 2-factor process, i.e. ID, password, biometrics, etc.

Solution 1.3: An entity should be established that is responsible for the administration of a repository of user and entity IDs and authentication.

Domain 2: Access rights and controls

Solution 2.1: Every provider/organization should have a policy and set of procedures that

- a. identify general roles or classes of individuals who will access information (smaller providers will need fewer classes)
- b. identify levels of access for each identified role
- c. details of how audit processes will be used to determine if policy and procedures are **being** used appropriately and how findings will be used to improve policy and procedures if necessary
- d. details of enforcement of policy and procedures
- e. explanation of the override to controls in an emergency situation

Solution 2.2: Technical controls for electronic access by role

Solution 2.3: Patient documentation of receipt of and education about policy and patients rights related to access by others to their record

Solution 2.4: Patient notification when audit identifies inappropriate access or use of record

Solution 2.5: No solutions details yet available in this domain for

- a. Patient control of access to EHR by specific individuals
- b. Patient access to record or audit trail of individuals who have accessed record

Domain 3: Patient and provider ID's and record locators

Solution 3.1: Determine best practices for identity validation/confirmation in compliance with NHIN framework. Institute these processes in Kansas.

⁵ **Kansas Health** Information Technology/Health Information Exchange Policy Initiative. (February 2007). **Final Report**. Retrieved from <http://www.khpa.ks.gov/QandI/Docs/Final%20State%20of%20Kansas%20Report.pdf>

Solution 3.2: Determine best practices for identifier assignment mechanisms in compliance with NHIN framework and NCVHS privacy and confidentiality recommendations. Provide guidance to Kansans through workshops and web-based resources.

Solution 3.3: Determine best practices for types of identification needed (*e.g.*, patient, provider, payor at personal and/or organizational level) depending on contexts and roles, consistent with NHIN framework. Provide guidance to Kansans through workshops and web-based resources.

Solution 3.4: Determine best practices for education concerning identifying patients, providers, etc., consistent with NHIN framework and NCVHS privacy and confidentiality recommendations. Develop an innovation adoption strategy for assignment of identifiers. Share solution in workshops for both the public and professionals; provide guidance materials on state web site

Domain 4: Information transmission security

Solution 4.1: An ongoing educational and knowledge sharing effort that is available to a wide variety of stakeholders. The educational/ knowledge program should be based around a general model of needed knowledge and organizational perspective as well as recognizing the anticipated transformation from a low-tech/low-HIE climate to a high-tech/full-HIE environment.

Solution 4.2: Monitor and audit stakeholders, including developing RHIOs, for use and compliance with identified national standards for security/privacy as well as exchange of data.

Solution 4.3: Identify and educate stakeholders on baseline expectations for network level security (*e.g.*, SSL) and how transmission level security connects to HIPAA in a climate of internal / external health information exchange. Extend this education and compliance expectation to a climate that monitors compliance and encourages periodic changes in the security approach. Encourage network security enhancements that exceed the minimum expectation of 128 or 256 bit encryption.

Solution 4.4: Facilitate applied research through collaboration with the state's universities that is focused by an assessment of the unique climate found in a rural setting and rural stakeholders, such as Critical Access Hospitals.

Solution 4.5: Build or extend a web capability to include "best practice" documents such as business associate agreements.

Domain 5: Preserving integrity of stored information

Solution 5.1: Identity authentication and role-based access policies for record and field-level data creation, revision, update, deletion.

Solution 5.2: Complete, auditable and reversible revision history

Solution 5.3: Continuous fraud detection activities